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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

APR 11 1996

In the Matter of Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Band	))))))	CC Docket No. 92-166

PETITION FOR RECONSIDERATION

Aeronautical Radio, Inc. (ARINC), by its attorneys, pursuant to Section 1.429 of the Rules, hereby petitions the Commission for reconsideration of its Memorandum Opinion and Order, adopted February 12, 1996 (MO&O),[1] to the extent that the MO&O would permit mobile earth terminals operating in the band 1610-1626.5 MHz to cause interference to signals of the Global Navigation Satellite System (GLONASS) currently operating in the band 1602-1616 MHz. In support whereof, the following is shown:

The Commission, in its 1994 Report and Order[2] in this proceeding, adopted regulations for the early introduction of mobile satellite service through the use of high capacity low earth orbiting satellites (Big LEOs). Because mobile earth terminals communicating with the Big LEOs cannot co-exist with the internationally coordinated co-channel operation by the GLONASS system, the Commission proposed an interim frequency plan to permit the Russian Federation to shift GLONASS to frequencies below

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[1] Summary, 61 Fed. Reg. 9944 (March 12, 1996).

[2] 9 FCC Rcd 5936 (1994).

1606 MHz, by the year 2005.[3] The Commission has now reversed this position, based the Commission's perception of "substantial uncertainty" as to the future of GLONASS and its need for protection.[4] However, since the adoption of the Commission's Report and Order, the future role of GLONASS as part of the Global Navigation Satellite System (GNSS) has become more certain and the need to protect GLONASS more essential. ARINC and the air transport industry respectfully request a return to the interim plan in order to protect domestic and international civil aviation and to comply with the treaty obligations of the United States.

I. BACKGROUND

At the Tenth Meeting of the Air Navigation Commission (10th ANC) of the International Civil Aviation Organization (ICAO) in 1991, the United States and the Russian Federation offered free use of Global Positioning Satellite (GPS) system and its GLONASS, respectively, to form the backbone of ICAO's GNSS. The 10th ANC recognized that joint use of GPS and GLONASS would improve reliability and integrity,[5] and adopted a recommendation "that ICAO, as a matter of urgency, develop the institutional arrangements (including integrity aspects) as the basis for the continued

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[3] Id. at 5956-59.

[4] MO&O ¶ 14.

[5] ICAO, Report of the Tenth Air Navigation Conference at 3-7 (Montreal 1991).

availability of GNSS for civil aviation."[6] Since 1991, the international aviation community, including the ICAO and Federal Aviation Administration (FAA), have been working diligently to establish GNSS using both GPS and GLONASS for both international and domestic use. Substantial investments have been made by the United States, the Russian Federation, and other nations in pursuit of civil use of this system.

After ICAO's decision to proceed with GNSS, the Big LEOs came to the 1992 World Administrative Radio Conference of the International Telecommunication Union (ITU) for additional spectrum in which they could offer and develop new services. As a result of this conference, a compromise was reached between the incumbent aeronautical radionavigation satellite systems and the newly proposed LEOs. Specifically, the Big LEO interests agreed that their use of the band 1610-1626.5 MHz would be conditioned on the provision that "stations of the mobile-satellite service shall not cause harmful interference to, or claim protection from, stations of the aeronautical radio and navigation service. . . ."[7] Aviation and the Big LEOs fully understood that this condition would severely limit the operation of mobile earth terminals at frequencies below 1616 MHz.

After the conference, the Office of Technology Assessment was critical of the U.S. position, noting that

> U.S. support for GPS/GLONASS dates back to 1987. . . . . At WARC-92, however, the United States not only supported, but proposed, frequency allocations for big LEOs

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[6] Id. at 4-7.

[7] ITU Radio Regulations 731E (Malaga-Torremolinos 1992) (now S5.364).

> that would use some of the same frequencies as GLONASS. This policy switch seriously undermines U.S. support of the GNSS system in the international eyes, and lead many frustrated domestic and international aviation officials to question why the United States was willing to jeopardize years of work on GNSS. Big LEO proponents, on the other hand, believe that it is possible for both services to share the band, and that U.S. positions were not mutually exclusive.
>
> Some analysts and delegates believe that the U.S. support for commercial big LEO systems over GLONASS/GNSS at WARC-92 not only damaged U.S. integrity internationally -- making it harder to "sell" U.S. positions at future conferences -- but also may have set a bad precedence for future conferences.[8]

OTA also observed that

> The United States now supports two systems/users competing for the same frequencies: GLONASS, which is viewed by the Federal Aviation Administration (FAA) as an integral part of the future Global Navigation System, and big LEOs.[9]

In order to harmonize these competing systems, the United States and the Russian Federation met in Washington in September 1994 to negotiate over the use of spectrum by GLONASS and the big LEOs. Russia, which now uses the band 1602-1616 MHz for GLONASS, agreed to move its operations to lower frequencies to accommodate the big LEOs. Russia has agreed to the following transition:

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[8] OTA, The 1992 World Administrative Radio Conference: Technology and Policy Implications at 118-19 (1993).

[9] Id. at 122.

Time	Frequencies	Channels
Present to 1998	1602-1616 MHz	0 to +24[10]
1998 to 2005	1598.1-1608.8 MHz	-7 to +12
Beyond 2005	1598.1-1604.25 MHz	-7 to +4

The interim frequency plan adopted in the Report and Order is consistent with this schedule, but the FCC's action on reconsideration would appear to be at odds with this understanding.

II. RECENT DEVELOPMENTS ENSURE THAT GLONASS WILL BECOME PART OF THE INTERNATIONAL AND DOMESTIC AERONAUTICAL NAVIGATION SYSTEM

The decision in the MO&O to retreat from its international obligation to protect the internationally coordinated operations of GLONASS does not take into account the events since the Report and Order solidifying GLONASS as an integral part of GNSS. The MO&O explains its decision on the basis that:

> GLONASS has not been incorporated into or accepted as part of the global navigation satellite system for aeronautical navigation either domestically or through the International Civil Aviation Organization, and at this time there is no date certain by which that may occur.[11]

Recent events lead to a different conclusion.

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[10] Russia has also agreed to avoid the radio astronomy band (channels 15-20), if possible.

[11] MO&O, ¶ 14.

First, GLONASS successfully launched the last two satellites of the 24-satellite constellation and one reserve satellite on December 14, 1995. These satellites entered into operation on January 7, and January 18, 1996. Thus, GLONASS is operational today.

Second, it is no longer true that GLONASS remains outside of the GNSS. In late 1994, the ICAO Council formally "accepted" the U.S. offer of GPS after GPS became operational.[12] Similarly, in the 147th Session of the ICAO Council, meeting in Montreal on March 14, 1996, GLONASS became part of the GNSS:

> The Council accepted the letter from the Minister of Transport of the Russian Federation. . . and authorized its President to send a letter to the latter communicating ICAO's acceptance of the offer from the Government of the Russian Federation of the Global Navigation Satellite System (GLONASS) for civil aviation on a world-wide basis. This exchange of letters would constitute a mutual agreement between the Government of the Russian Federation and ICAO concerning GLONASS.[13]

As a result, GLONASS is just as integral a part of the GNSS as is GPS. The Commission has already concluded that "if GLONASS is incorporated into a system for aeronautical navigation. . .protection of GLONASS operations might be required."[14] Since GLONASS has now been "incorporated into or accepted as part of the global navigation satellite system,"[15] the Commission must now revert to its interim big LEO sharing plan.

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[12] See ICAO, Report of the Second Meeting of the Global Navigation Satellite System Panel (Montreal, November 14-24, 1995) (GNSSP/2) at 1A-5.

[13] Summary of Decisions, ICAO Council, ¶ 3 (Mar. 14, 1996) (attached hereto).

[14] MO&O ¶ 12.

[15] Id., ¶ 14.

Third, ICAO continues to work to incorporate GLONASS into the GNSS on an equal basis with GPS. Draft Standards and Recommended Practices (SARPs) are under preparation by ICAO's Global Navigation Satellite System Panel (GNSSP). At its meeting in Montreal on 14-24 November 1995, the Panel concluded that:

> Significant benefits (increased accuracy, integrity, availability and continuity) can be provided by combined use of GPS and GLONASS signals in the same avionics. RTCA is developing avionics minimum operational performance standards (MOPS) for GPS augmented with GLONASS. The Airlines Electronic Engineering Committee (AEEC) has developed Aeronautical Radio, Inc. (ARINC) Characteristic 743A which addresses the form, fit and function for airline installation of one unit that includes GPS and GLONASS. Several manufacturers have designed equipment that could meet the AEEC requirements, and this designed could be modified to meet the RTCA draft MOPS requirements. Manufacturers have developed GPS/GLONASS receiver cards that can be used in a portable computer. The demand for this equipment should increase after GLONASS becomes operational.[16]

The GNSS Panel also adopted a timetable for completion of SARPs and guidance material for GPS and GLONASS in 1997.

Fourth, RTCA, Inc., through SC-159, is working on MOPS for GPS and GLONASS for domestic use and certification of these navigation systems down to non-precision approach altitudes within the United States. (Precision approach MOPS will follow.) It would be disingenuous for the big LEOs to claim that GLONASS has not yet been incorporated into the navigation systems for the United States. Everything is

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[16] ICAO GNSSP/2 Report at 1A-22. Of course, as noted above, GLONASS is now fully operational.

progressing towards that end, including the use of GLONASS within the United States, and at approach altitudes. The use of GLONASS in conjunction with GPS increases the reliability, integrity, continuity and availability of the system. RTCA should complete MOPS for GLONASS by the end of this year.

Finally, President Clinton on March 29, 1996, issued a Presidential Decision Directive to promote the use of GPS by civilian agencies. Under the Directive, selective availability -- the ability of the Department of Defense to degrade the performance of GPS -- will be phased out between 2000 and 2006. This action will spur use of GNSS and create a demand for the improved service that is made possible through use of GPS and GLONASS, especially before 2006 while selective availability may continue to create concerns over the precision of the system.

III. THE FCC SHOULD COMPLY WITH ITS TREATY OBLIGATIONS TO PREVENT INTERFERENCE TO RADIONAVIGATION SYSTEMS

The FCC takes some solace from the potential of resolving interference conflicts during international coordination. However, the United States is obliged to comply with the ITU Radio Regulations, and the Convention on International Civil Aviation, and coordination alone might not protect the use of GLONASS.

The current operations of GLONASS will receive interference from mobile earth stations in U.S. airspace operating with big LEOs. In addition to the obligations under ITU Radio Regulations S5.364, the Radio Regulations provide that

> Members recognize that the safety aspects of radionavigation and other safety services require special measures to ensure their freedom from harmful interference; it is necessary therefore, to take this factor into account in the assignment and use of frequencies.[17]

Further, the operation of these stations should be protected even in U.S. airspace. First, as noted above, the system will be used as part of the U.S. national airspace, and the FCC's assignments should accommodate that need. In addition, it will be used by non-U.S. aircraft operating in U.S. airspace, which they are permitted to do under Chapter 2 of the Convention of International Civil Aviation (Chicago Convention), who may use GLONASS as their sole means of navigation.[18] Once SARPs are completed, they will also have the force of law in the United States under Article 37 of the Chicago Convention.[19]

Finally, the interim plan originally adopted by the FCC fully meets the requirements of the big LEO market. While it is true that, if the market responds, the big LEOs will require more spectrum, it is also true that they will be able to operate under the interim plan and expand as the market for these services develops. During the time that GLONASS is moving first down below 1610 and then down below 1606 MHz, the big LEOs will have ample spectrum in which to operate, and will be able to grow as aviation is able to move its operations into the lower frequencies. The FCC's original

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[17] ITU Radio Regulations S4.10 (1995) (former RR 953).

[18] Convention on International Civil Aviation, Chapter 2 (Chicago, 1947).

[19] Id. Art. 37.

plan complied with its international obligation while fully accommodating the requirements of the big LEOs.

* * * *

Therefore, ARINC, in light of events since the 1994 Report and Order which have added substance to the need to protect GLONASS from harmful interference, and events since the February MO&O, ARINC urges the Commission to reinstate the interim frequency plan and protect aviation use of GLONASS at approach altitudes through 2005.

Respectfully submitted,

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C-DEC 147/15
15/3/96

COUNCIL - 147TH SESSION

FIFTEENTH MEETING

(THE COUNCIL CHAMBER, THURSDAY, 14 MARCH 1996 AT 1430 HOURS)

SUMMARY OF DECISIONS

Open Meeting

Offer of the Global Navigation Satellite System (GLONASS) from the Government of the Russian Federation (Subject Nos. 14, 16 and 45)

1. The Council resumed (147/14) and completed its consideration of the above subject, documented in Memorandum PRES AK/495 dated 20 February 1996, to which was attached a copy of a letter dated 5 February 1996 from the Minister of Transport of the Russian Federation containing the offer from his Government of the Global Navigation Satellite System (GLONASS); in C-WP/10396 (presented by the Secretary General) and in C-WP/10397 (presented by the Russian Federation).

2. Certain additional information and clarifications were provided by the Representative of the Russian Federation in light of the previous (147/14) day's debate and the summary thereof given by the President of the Council. It was agreed that these would be incorporated into the said letter from the Minister of Transport of the Russian Federation, as follows: in the fourth paragraph, the phrase "Subject to the allocation of resources, as required under the legislation of the Russian Federation," would be added; on the third line of that paragraph, the phrase "on a non-discriminatory basis" would be inserted after the word "community"; and a new sentence would be added at the end of the paragraph, reading : "The Russian Federation shall take all necessary measures to maintain the integrity and reliability of the service and expects that it will be able to provide at least 6 years' notice prior to termination of services."; the fifth paragraph would be deleted, its contents having been incorporated into the fourth paragraph; a new seventh paragraph would be added, reading: "The Russian Federation will also undertake a continuing exchange of information with ICAO regarding the operation of GLONASS to assist the ICAO Council in carrying out its responsibilities under the Chicago Convention."; and in the third line of the eighth paragraph, the word "sovereign" would be added before the word "airspace".

3. The Council accepted the letter from the Minister of Transport of the Russian Federation as modified above and authorized its President to send a letter to the latter communicating ICAO's acceptance of the offer from the Government of the Russian Federation of the Global Navigation Satellite System (GLONASS) for civil aviation on a world-wide scale. This exchange of letters would constitute a mutual agreement between the Government of the Russian Federation and ICAO concerning GLONASS.

4. It was understood that a State letter transmitting the text of this exchange of letters would, in due course, be issued by the Secretary General to all Contracting States, as well as non-Contracting States and international organizations concerned.

CERTIFICATE OF SERVICE

I hereby certify that on this 11th day of April, 1996, I caused copies of the foregoing "Petition for Reconsideration" of Aeronautical Radio, Inc., in CC Docket No. 92-166 to be mailed via first-class, postage prepaid, to the following:

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